PATENT SPECIFICATION

660,822

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PROVISIONAL SPECIFICATION

Improvements in or relating to Devices for Facilitating the Suspension or Transport of Articles containing Spillable Media

I, GEORGE FREDERICK BALDOCK, a British subject, of 82, West Cromwell Road, London, S.W.5, do hereby declare the nature of this invention to be as follows :—

In many divers instances the moving or transporting of containers and so on with spillable contents, e.g. cups and tumblers filled with liquid, always involves difficulty if these contents are to be prevented from spilling. This not only applies to the carrying of the containers in the hand or on trays or suchlike supports, but to cases where the containers are placed on a surface which does not remain steady, as in ships, aeroplanes, and railway trains.

It is an object of this invention to provide a means whereby the effects of movement on open-topped containers can be compensated by the centrifugal action engendered by this movement.

Hence, in accordance with the invention I provide a suspension means for association with, or connection to, the container, this suspension means being attached at an upper, central part by a universal, gimbal or ball joint to a loop or hook such that, with this loop or hook itself suspended, the aforesaid joint permits the suspension means, and hence the container, to swing under the influence of motion imparted thereto so as to preclude spilling of its contents.

The aforesaid joint may be of any form permitting unrestricted movement of the suspension means. Conveniently, therefore, it comprises a ball secured to a rod or other element which passes through an aperture in the aforesaid central part of the suspension means. This aperture is of smaller diameter than the ball, and hence the latter bears against the underside of this part. The rod or equivalent element is of substantially smaller diameter than the aperture, so as not to contact the edges of this aperture and interfere with the motion of the suspension means. If desired the ball may be provided with a chamfered seating.

At its outer or upper end the rod or equivalent is provided with a loop or hook whereby it may be attached to a carrying device, e.g. a hook on a tray or trolley, or may be carried by the finger. Again, this carrying hook or loop may be arranged closely adjacent the said aperture so as to limit the travel of the ball relatively to the aperture, in the direction of the axis of the latter. Furthermore, the rod or other element could be omitted and the hook or loop secured directly to the ball.

In other embodiments of the invention the ball is connected to the said suspension means, e.g. through an upstanding stem on the latter, and this ball mounted in universal fashion in an element connected to the loop or hook, e.g. in an inverted cup-shaped shell or between a pair or other plurality of arms or claws having a seating for the ball.

Reference has been made to the use of a ball joint to provide for the desired movement of the suspension means relatively to the carrying loop or hook, but it will be understood that any other suitable form of universal or gimbal joint can be used, for instance a pair of cross rods each arranged for rotation about its axis in a bracket secured respectively to the suspension means and to the carrying loop or hook.

The suspension means may also take a wide variety of forms. Thus, for example, it may comprise a horizontal loop, or a plurality of superposed horizontal loops, carried by two or more upstanding arms (e.g. forming parts of a bowed skeleton frame), these loops being dimensioned so as to serve in supporting saucers or plates which in turn will support the containers to be guarded against spilling. The aforesaid arms are suitably pivotally connected to the loop, or the upper loop, so as to enable them to be

collapsed when not in use, thereby facilitating packing. Alternatively, or in addition, the frames may otherwise be collapsible for this purpose, e.g. the arms may be telescopic.

Where two or more layers of loops are provided, the interconnecting frame parts between them may also be collapsible, but in all cases it is preferable to provide securing means whereby the parts of the suspension frame are maintained in rigid condition during use.

The interconnecting frame parts referred to in the preceding paragraph may comprise a plurality of arms, and the lower part of these may be downwardly cranked or bent below their point of attachment to the lower or lowest loop to provide feet by means of which the suspension means can be stood on a table or the like when required.

It will be understood that the suspension means can take many other forms, for example a tray, a superposed and interconnected plurality of trays, and so on.

It will also be appreciated that, in use, a plurality of these frames, trays and so on can be suspended from a common support, e.g. a shelf, by means of their loops or hooks, so that they respond in such manner to any movement of the shelf or the like as to preclude spilling of the contents of containers carried thereby.

Dated this 3rd day of December, 1948.
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COMPLETE SPECIFICATION

Improvements in or relating to Devices for Facilitating the Suspension or Transport of Articles containing Spillable Media

I, GEORGE FREDERICK BALDOCK, a British subject, of 82, West Cromwell Road, London, S.W.5, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement :—

This invention concerns improvements in devices for facilitating the suspension or transport of articles containing spillable media, and has for its object the provision of devices which will facilitate the movement or transport of spillable media, e.g. soups, beverages, small solid articles, powders or the like, without spillage thereof, such devices also being of use in the storage of spillable media in vehicles or the like which are subject to changes in velocity.

According to this invention there is provided a device for facilitating the transport of spillable media, such device comprising a rigid frame carrying, or having means for carrying, a container for spillable media, and also having a handle, hook, loop or the like universally pivotally connected thereto at a point above the centre of gravity of the device and enabling the device to be carried in the hand or suspended from a hook or the like on the structure of a vehicle, tray, trolley or the like.

According to a further aspect of this invention, there is provided a device for facilitating the transport of spillable media, such device comprising a rigid frame having means, spaced from its upper part, for carrying a container for spillable media, and a handle, hook, loop or the like mechanically connected thereto at a point above the centre of gravity of the device, the connection between the frame and the said handle, hook, loop or the like being adapted to permit universal pivotal movement between these parts.

Thus if the said handle, hook, loop or the like is subjected to changes in velocity the said framework will oscillate with respect to the handle, hook, loop or the like under the influence of its inertia, and any spillable medium, e.g. liquid in a container carried by the said framework, will tend to perform a similar motion with respect to the said handle, hook, loop or the like and thus the surface of the liquid in the container will tend to remain stationary with respect to the container and the framework carrying such container. Thus spilling of the liquid will be minimised.

The said handle, hook, loop or the like is preferably universally pivotally connected to the said framework by means of a single or double ball joint; when the device is furnished with a hook or loop a single ball joint is preferably employed, one end of the hook or loop (which is conveniently fashioned from a metal rod or wire) passing through a hole in the upper part of the said framework and being provided with an enlargement or boss (hereinafter referred to as a boss) at

its lower end, said boss having a spherical upper surface adapted to co-operate with a corresponding concave surface provided at or adjacent the lower end of the said hole in the framework.

Alternatively, e.g. when the device is furnished with a handle, both the latter and the upper part of the framework may be provided with aligned holes through which a rod passes vertically, such rod being provided at its upper end with a boss having a spherical under surface adapted to co-operate with a corresponding concave surface at or adjacent the upper end of the said hole in the handle, whilst a boss with a spherical upper surface adapted to co-operate with a corresponding surface at or adjacent the lower end of the said hole in the framework, is carried by the said rod adjacent the lower end thereof.

This invention also provides a device for facilitating the transport of spillable media, such device comprising an inverted U- or bail-shaped frame having a handle universally pivotally connected centrally to the upper end thereof above the centre of gravity of the device, and means for supporting at or near the lower end thereof a vessel containing spillable media.

To enable the invention to be understood and readily carried into practice I have appended hereto drawings illustrating various devices according to the invention, these being given by way of example. In the drawings :—

Figure 1 is a front elevation of one form of device in accordance with the invention, showing a cup and saucer and a plate carried thereby.

Figure 2 is an enlarged detail illustrating the joint and hook used in the structure of Figure 1.

Figure 3 is similar to Figure 2 but illustrates a modification.

Figure 4 is a front elevation of a further embodiment of the device of this invention.

Figure 5 is a perspective view of devices as illustrated in Figure 1, applied to a particular use.

Figure 6 is a side view partly in vertical section of a further embodiment of the invention.

Figure 7 is a plan view on VII–VII of Figure 6.

Referring first to the illustration of Figures 1, 2 and 5, the form of device there illustrated comprises a main skeleton structure 1 and a suspension hook 2 loosely connected thereto.

The frame 1 consists, in the main, of two arms 3 which are integral with one another, being formed from a length of steel or other metal strip. This strip is bent into a generally bowed, inverted U- or bail-shaped formation and is cranked at 4, towards the lower end of each arm 3.

At its upper central part the frame 1 is apertured, as at 5, and passing loosely through this aperture is the stem or rod 6 of the hook 2. The rod or stem 6 is of substantially smaller diameter than the aperture 5 so as not to contact the sides of this aperture and interfere with the motion of the suspension device, but the aperture 5 is of considerably smaller diameter than a boss 7 provided on the end of the rod or stem 6.

This boss 7 is of hemispherical shape, the rounded surface thereof being applied against the underside of the frame 1 in use. If desired the aperture 5 can be chamfered to provide a smooth seating for the boss 7.

The hook 2 enables the complete device to be suspended from a carrier, for example a hook on a tray or trolley, or to be carried by the finger.

An example of the former arrangement is illustrated in Figure 5 where two such devices are shown suspended from hooks 8 on the underside of a tray 9. The latter is particularly adapted for use on board a ship, so that when the vessel is subject to the usual movements consequent on meeting swells and so on, the devices 1 are able to swing freely without their contents being spilled, whereby the use of the usual "fiddles" is avoided. The tray 9 in this case is provided with legs 10 which are arranged to fit into sockets 11 on the surface of the table 12 as indicated in the drawings. It may here be interpolated that the legs 10 could conveniently be foldable relatively to the tray 9, and also that a contrivance of this character is also suitable for use as a table and support for persons in bed.

The actual supporting of the articles (such as the cup 13 and saucer 14 and the plate 15 carrying articles of food 16 in Figure 1) is effected by means of circular frames 17 and 18, each of which is dimensioned to receive and support a saucer and a plate respectively and which have a pair of diametrically opposed lugs 19 with an upturned end portion 20, by means of which it is pivoted to the corresponding arm 3, a pivot pin 21 being used for this purpose. A spring pressed locking ball or plunger 22 is conveniently provided and arranged to co-operate with a corresponding recess in the arm 3 to retain the associated frame in its horizontal condition of use. By a quick movement, or by appropriate manipulation, the portion 20 can be released from this spring loaded engagement with the arm, so that the frame can be collapsed more or less into the general plane of the skeleton structure when not required for use.

In the embodiment illustrated in Figure 3 the hook 2 is replaced by a loop 23 which is

apertured to receive a rod 24 carrying, screw threadedly, at its two ends spherical bosses 25 and 26. The upper end of the boss 26 is movable in a correspondingly-shaped recess 27 at the central bend of the two arms 3, whilst the boss 25 is received in a part-spherical recess 28 forming the termination of an aperture 29 in the loop 23. A corresponding aperture 30 is provided at the junction of the arms 3 for the passage of the rod 24.

In the Figure 3 construction, it will be observed that a double universal joint is provided, and that the structure represented by the arms 3 can swing and move in any desired direction relatively to the loop 23, thus permitting free swinging of the device.

The modification of Figure 4 is intended primarily to illustrate the use of a suspension frame 31, on which a plate, saucer, dish, or other device can be lodged and supported. This frame is, in use, carried by a pair of arms formed, as in the preceding cases, by a bent strip 32 which, at its ends, is connected to the frame by means of a pivot 33.

Here again, a spring-pressed ball catch, designated 34, is provided so as releasably to secure the arms 32 in their position at right angles to the main plane of the frame 31, i.e. the position of use. The suspension hook 2 is articulated to the arms 32 by one of the universal joint means previously referred to.

The device illustrated in Figures 6 and 7 is similar to that of Figure 1, but the frame 1 has four arms 3 each of which terminate in scroll-like feet 35. At their upper ends the arms 3 are secured to a common cap 36 in which the hook 2 is mounted by a ball-joint as previously described, and at their lower ends these arms are interconnected by a member 37.

The utensil (in this case shown as a saucer 14 carrying a cup 13) is supported in an inner ring 38 which is secured by diametrically-opposite gimbals 39 extending between lugs 40 on the ring 38 and corresponding lugs 41 on an outer ring 42 and this in turn has further upstanding lugs 43 mounted by a further pair of gimbals 44 in an opposite pair of arms 3. It will be noted that the gimbals 39 are on a diameter at right angles to that on which the gimbals 44 are located.

Each of the gimbals 39 and 44 comprises a rivet head 45 and a stem 46 with a neck 47 around which the appropriate ring lug is pivotally secured. Hence the ring 38 can pivot about one diameter relatively to ring 42, and the latter can pivot about a diameter at right angles to the first, relatively to the frame 1. Hence an article supported on ring 38 is floatingly mounted in the device.

Set screws 48 are provided for locking the rings 38 and 42 together and to the frame.

Hence, when articles are to be transported (on, say, a ship) by a person carrying the device, the screws 48 will be tightened up to "lock" the various parts rigidly to one another, and the device carried as in any of the instances already described. When, however, the device is stood on a table by means of the feet 35, the screws will be loosened so that movement of the ship or the like will not affect the article supported.

As will be understood, this arrangement can be applied to any other devices embodying the present invention.

It will be apparent that many other modifications are possible within the scope of this invention, for example the joint may be formed by a ball which is connected to the suspension device, by means of an upstanding stem on the latter, and this ball mounted in universal fashion in an element connected to the loop or hook, e.g. in an inverted cup-shaped shell or between a pair or other plurality of arms or claws having a seating for the ball.

Ball joints providing for the desired movement of the suspension means relatively to the carrying loop or hook have been described, but it will be understood that any other suitable form of universal or gimbal joint can be used, for instance a pair of cross rods each arranged for rotation about its axis in a bracket secured respectively to the suspension means and to the carrying loop or hook.

Again, the supporting frames may, alternatively or in addition, be otherwise collapsible, for instance the arms may be telescopic.

Where two or more frames or loops are provided, the interconnecting frame parts between them may also be collapsible, but in all cases it is preferable to provide securing means whereby the parts of the suspension frame are maintained in rigid condition during use.

The interconnecting frame parts referred to in the preceding paragraph may comprise a plurality of arms, and the lower part of these may be downwardly cranked or bent below their point of attachment to the lower or lowest loop to provide feet by means of which the suspension means can be stood on a table or the like when required.

It will be understood that the suspension device can take many other forms, for example a tray, a superposed and interconnected plurality of trays, and so on.

HAVING NOW particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. A device for facilitating the transport of spillable media, such device comprising a

rigid frame carrying, or having means for carrying, a container for spillable media, and also having a handle, hook, loop or the like universally pivotally connected thereto at a point above the centre of gravity of the device and enabling the device to be carried in the hand or suspended from a hook or the like on the structure of a vehicle, tray, trolley or the like.

2. A device for facilitating the transport of spillable media, such device comprising a rigid frame having means, spaced from its upper part, for carrying a container for spillable media, and a handle, hook, loop or the like mechanically connected thereto at a point above the centre of gravity of the device, the connection between the frame and the said handle, hook, loop or the like being adapted to permit universal pivotal movement between these parts.

3. A device according to claim 1 or 2, wherein the said handle, hook, loop or the like is connected to the said frame by means of at least one ball joint.

4. A device according to claim 3, wherein the said connection between the said handle, hook, loop or the like and the said frame includes a rod forming part of, or carried by, the said handle, hook, loop or the like, said rod passing substantially vertically through a bore in the upper part of the said frame, and being furnished with a boss having a part-spherical upper surface adapted to co-operate with an annular seating at one end of the said bore.

5. A device according to claim 4 wherein the lower part of the handle is provided with a bore through which the said rod passes, the latter being furnished with a boss having a part-spherical under surface adapted to co-operate with an annular seating at the upper end of the said bore in the lower part of the said handle, hook, loop or the like.

6. A device according to any of the preceding claims, wherein the said frame includes an upstanding inverted U- or bail-shaped structure to which the said handle, hook, loop or the like is universally pivotally connected at the upper part thereof and, spaced from the upper end of said frame, at least one horizontal supporting element shaped so as to be capable of receiving and supporting thereon or therein one or more containers or the like, e.g. a saucer, plate, bowl or dish.

7. A device according to claim 6, wherein two horizontal supporting elements are secured to the said structure in spaced superposed relationship.

8. A device according to claim 7 wherein each of the said supporting elements is in the form of a tray on which objects may be rested.

9. A device according to claim 6 or 7, wherein the or each horizontal supporting element is pivotally secured to the said structure to enable said supporting element or elements to be swung substantially into parallelism with the said structure when not in use.

10. A device according to claim 6 or 7, wherein the or each horizontal supporting element is mounted in the said structure by means of gimbals.

11. A device according to claim 10, wherein the or each horizontal supporting element comprises a pair of concentric rings, the inner ring of such pair being journalled to the outer ring at diametrically opposed locations, and the outer ring being journalled to the said structure at diametrically opposed locations in a plane perpendicular to the vertical plane containing the journals of the said inner ring.

12. A device according to any of claims 7 to 9, including locking means for securing said supporting element or elements in a horizontal 'attitude' with respect to said structure.

13. A device according to claim 12, wherein said locking means comprise spring catches.

14. A device for facilitating the transport of spillable media, such device comprising an inverted U- or bail-shaped frame having a handle universally pivotally connected centrally to the upper end thereof above the centre of gravity of the device, and means for supporting at or near the lower end thereof a vessel containing spillable media.

15. A device for facilitating the transport of spillable media substantially as herein described and as shown in Figures 1 and 2 or modified as shown in Figure 3 of the accompanying drawings.

16. A device for facilitating the transport of spillable media substantially as herein described and as shown in Figure 4 of the accompanying drawings.

17. A device for facilitating the transport of spillable media substantially as herein described and as shown in Figure 5 of the accompanying drawings.

18. A device for facilitating the transport of spillable media substantially as herein described and as shown in Figures 6 and 7 of the accompanying drawings.

Dated this 5th day of December, 1949.

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FIG. 1.

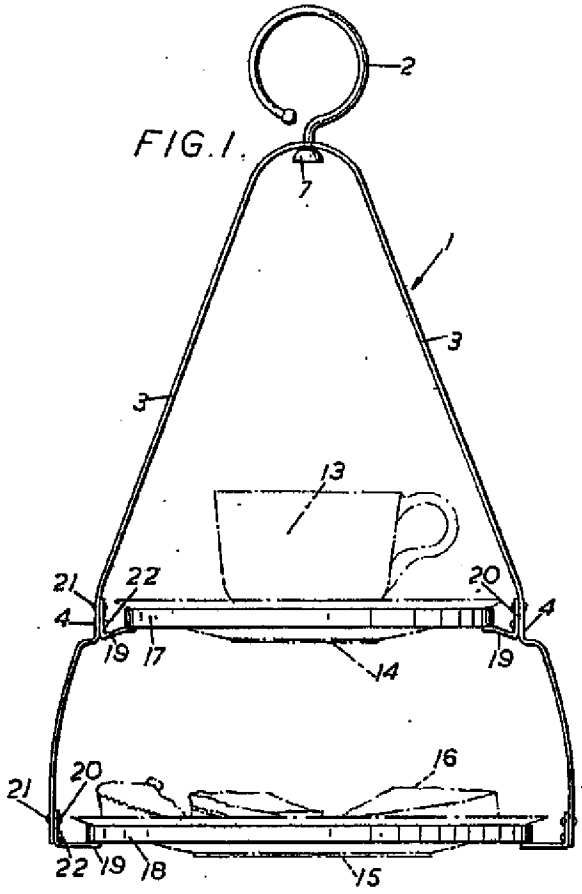


FIG. 2.

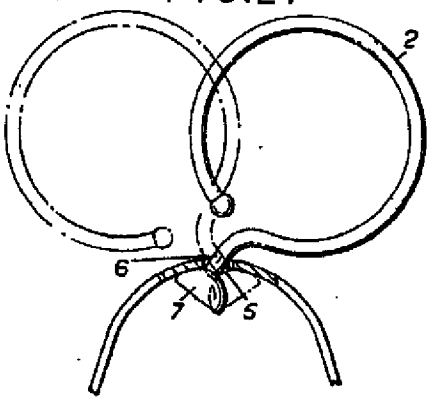


FIG. 3.

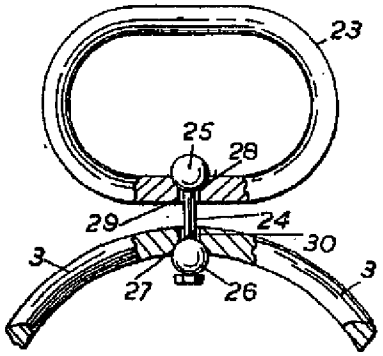


FIG.4.

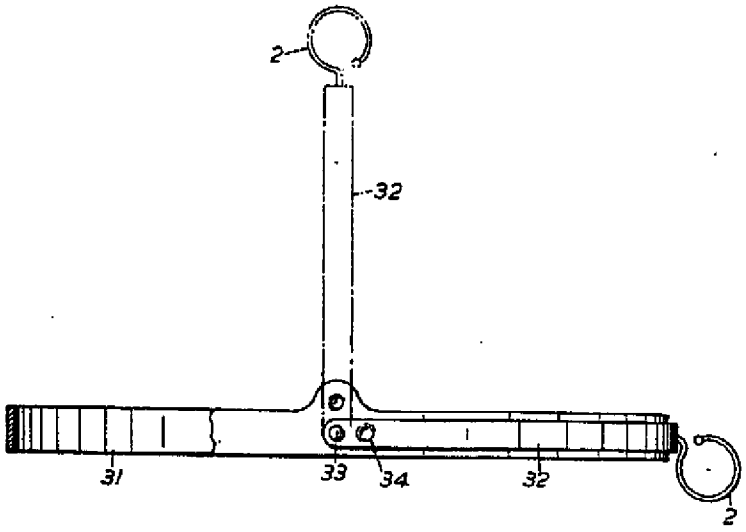
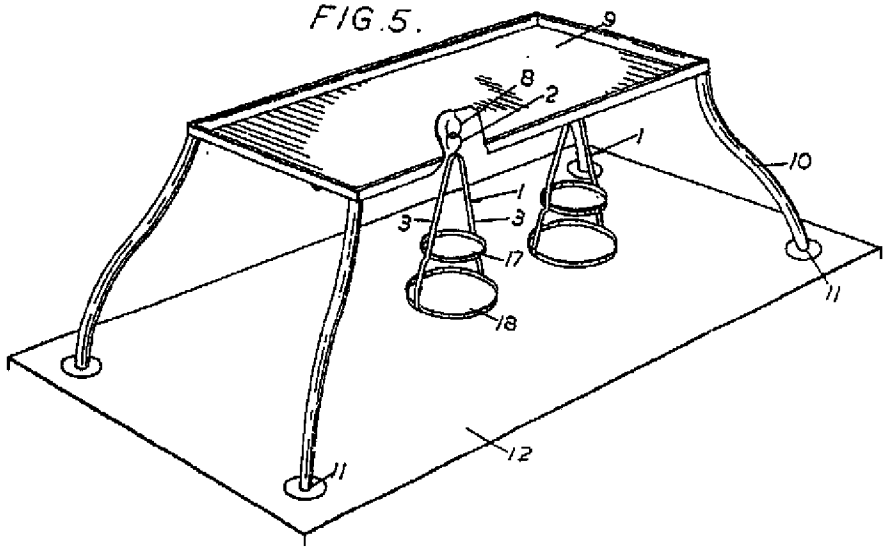
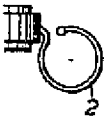


FIG.5.

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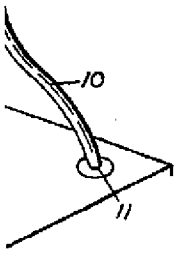
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FIG.6.

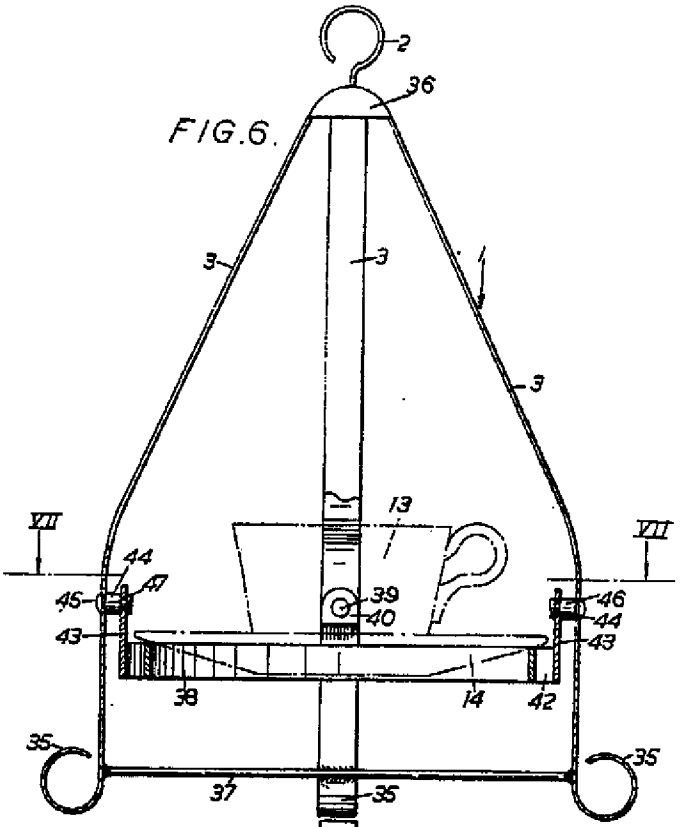
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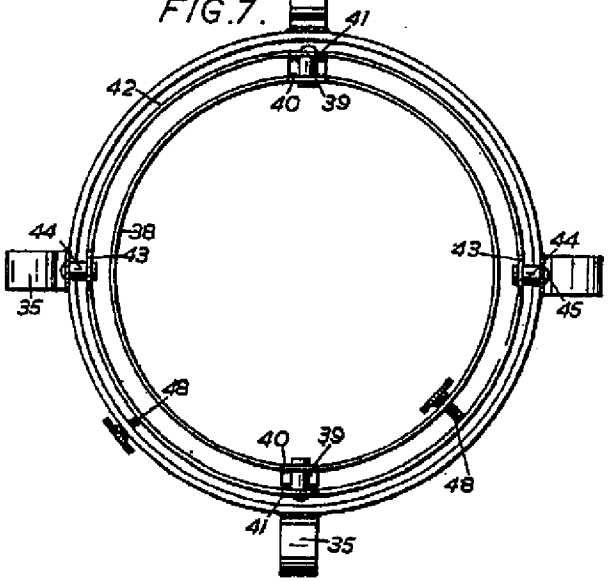
FIG.7.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660,822 COMPLETE SPECIFICATION

3 SHEETS

SHEET 2

FIG 4.

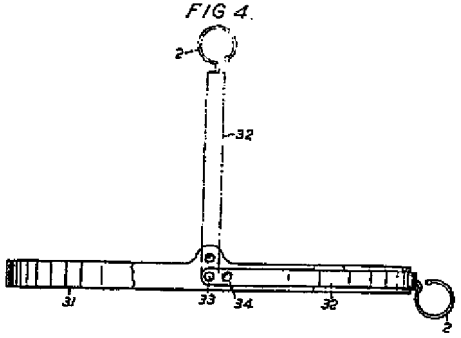
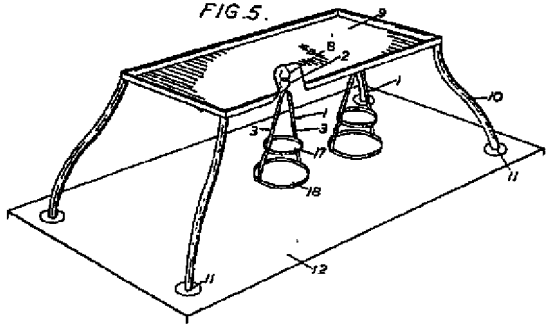


FIG.5.



SHEET 3

FIG.6.

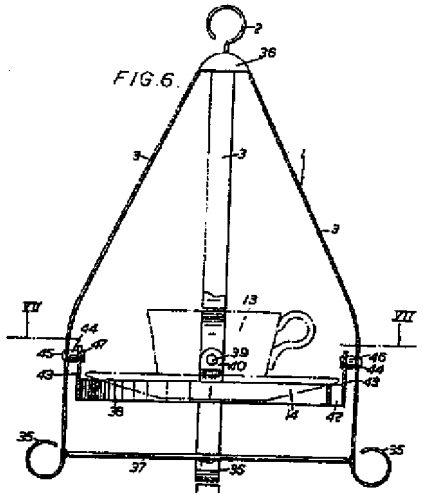
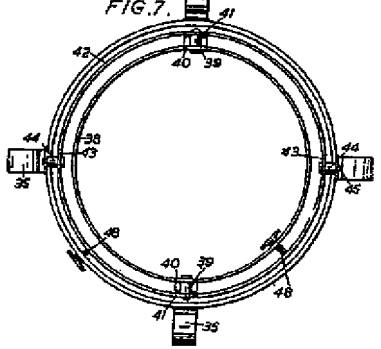


FIG.7.



This Drawing is a reproduction of the Original on a reduced scale

H.M.S.O.(M.F.P.)